

AC Ductless Single or Multi Split- System.

Specifically reviewing the requirement for a disconnect switch for the indoor unit.

Indoor AC fan unit, evaporator fan motor, fan coil unit are some of the names associated with this Indoor Unit, the question commonly ask is if they considered an Appliance, Motor driven Utilization equipment, or AC equipment?

The answer is all of the above!

The following code review will help in understanding the indoor unit's requirements.

All three articles apply, and each Article, 422 and 430 make reference to article 440.

Section 422.3 states Article 440 applies, Except as **specifically (emphasis)** amended; such as 422.12 Ex. No. 2,

Section 430.5 Table 430.5 refers to Article 440 for motors in AC equipment, and

Section 440.3(A) states Article 440 can amend **Article 430** and

Section 440.3(B) states Article 440 shall provide the requirements for AC equipment (**system**) that have a Hermetic refrigerant motor-compressor(s).

Section 440.1 Scope, The provisions of this article apply to electric motor-driven air-conditioning equipment and controllers for such equipment. *This is in reference to a complete AC system.*

The provisions for the indoor unit disconnect switch are as follows:

Disconnecting Means, Section 440.11, **Motors and controllers**

Rating, Section 440.6 (B)

Location, Section 440.14 within sight and readily accessible, shall be permitted *on or within*

Article 430 provides the **Type** in section **430.109**, and **Operation** in section **430.103**

Article 422 contains no provisions on any disconnect switches for this type of AC equipment (system).

Conclusion:

A disconnect switch is required within sight of the Listed combination indoor unit.

In most residential installations, a listed (motor) general snap switch rated in HP (UL WB PG. 436) or a listed (motor) unit switch provided on or within the unit can provide the required disconnecting means. The switches shall also conform to all of the provisions described above.

So what really changed? Section 440.14 is more restrictive than section 430.102 because it does not depend on the controller or motor location when considering the disconnect location. It instead focuses on the equipment. This Section places a disconnect switch within sight and readily accessible to the indoor unit location with only two exceptions.

Section's 440.14, Informational note Number 1, reminds the reader, to go back to Part VII and IX of Article 430 for the other requirements such as type and operation.

Supporting Material

Commentary in NEC 2011 Handbook®:

Because 440.3(A) makes the requirements in Article 440 in addition to or amendatory of the provisions of Article 430, **the requirement of 440.14 mandates that the equipment disconnecting means be within sight from and readily accessible from the equipment, even if there is also a remote disconnect capable of being locked in the “open” position under the provision of the exception to 430.102(B).**

This special requirement for air-conditioning and refrigeration equipment covered by **Article 440 is more stringent than the provisions in Article 430**, to provide protection for service personnel working on equipment located in attics, on roofs, or outside in a remote location where it is difficult to gain access to a remote lockable disconnect. See Exception No. 1 to 440.14.

Article 100 Definitions

Part I of this article contains definitions intended to **apply wherever the terms are used** throughout this Code.

Appliance. *Utilization equipment*, generally other than industrial, that is normally built in standardized sizes or types and is installed or connected as a unit to perform one or more functions such as clothes washing, air conditioning, food mixing, deep frying, and so forth.

Article 440 applies too:

Section 440.1 Scope

- (1) **(ALL)** Electric motor driven air-conditioning equipment.
- (2) Branch circuits and controllers for the air conditioning equipment.
- (3) Special requirements for branch circuits supplying a hermetic refrigerant motor-compressor.
- (4) Special requirements for Air-conditioning equipment supplied from an individual branch circuit that supplies a Hermetic refrigerant motor-compressor.

440.3 Other Articles

Section 440.3 (A) Article 430

- (1) Article 440 is in addition too and can amend the provisions of Article 430.
- (2) Article 440 may alter the provisions of Article 430.

Section 440.3 (B) Article 422,424,430 (as applicable)

(B) Articles 422, 424, or 430. The rules of Articles 422, 424, or 430, as applicable, shall apply to air-conditioning and refrigerating equipment that does not incorporate a hermetic refrigerant motor-compressor. This equipment includes devices that employ refrigeration compressors driven by conventional motors, furnaces with air-conditioning evaporator coils installed, fan-coil units, remote forced air-cooled condensers, remote commercial refrigerators, and so forth.

In other words Article 440 applies too (ALL) air-conditioning equipment that *incorporates** a hermetic refrigerant motor-compressor.

(*part of an AC **system** that includes hermetic refrigerant motor-compressor.)

Article 422, Appliances

Section 422.3, Article 440 shall apply to the installation of appliances containing a hermetic refrigerant motor compressor(s), except as *specifically* amended in this article. See 422.12 Ex. 2

This Section is clarifying that the AC equipment (system) that includes a Hermetic refrigerant motor-compressor are installed according to Article 440. This applies to all section of the AC equipment (appliance).

Sections 440.3(B) and 422.3 also indicate when a *standalone-listed appliance (AC equipment)* is paired with another *standalone-listed appliance listing*; **Article 422 applies to the listed appliance without the hermetic refrigerant motor compressor**, such as: A furnace with air-conditioning evaporator coils. the furnace is a standalone appliance. **Article 422** would apply to the furnace. This equipment includes devices that employ refrigeration compressors driven by conventional motors. **Article 430** would apply to the motor.

An AC Ductless Single split system or Multi split system is a *complete listed assembly of AC equipment*.

UL White Book®

HEATING AND COOLING EQUIPMENT (LZFE)

GENERAL INFORMATION

Product Types

1. The following defines the types of systems covered in the individual categories below:

G. Heating, Cooling and Ventilating Equipment — Intended for use as **part of a complete system** and, when installed, may be associated with other equipment and components that are separately Listed.

2. Heating and cooling equipment of the unitary type consists of one or more factory-built sections. If the **equipment is provided in two or more sections**, each such section is designed for field interconnection with a **matched section(s)** to make the heating and/or **cooling equipment**. Equipment provided in two or more sections is either marked to identify the appropriate sections for proper installation, or the **designations of the sections comprising the assembly are shown in the individual Listings**. Where so designated, a separately Listed electric central heating furnace, fan-coil unit or fan unit may serve as a portion of the assembly.

FAN-COIL UNITS
SECTIONS OF FAN-COIL UNITS
ACCESSORIES FOR FAN-COIL UNITS

GENERAL INFORMATION paragraphs **1G**, 2, 3, 4, 5, and 9 through 20 inclusive are applicable to this equipment.

This category covers appliances that include a motor-operated fan or blower together with a cooling coil, a heating coil, or both, and may also include an electric heater. The fan or blower is designed to recirculate air or to draw in outside air, or both. The coil may be designed for refrigerant cooling, for refrigerant heating, for chilled water cooling, for hot water heating, for steam heating, or for combinations of these functions.

A fan-coil unit containing a refrigerant coil that has been additionally investigated **as part of a specific split-system cooling air conditioner**, special purpose air conditioner or heat pump, is also **identified as part of that system** in the individual Listings as “Air Conditioners, Central Cooling,” “Air Conditioners, Special Purpose” or “Heat Pumps.” A fan-coil unit, as covered by these requirements, may be designed for free delivery of air to the room

Appendix A, Electrical Heating and Cooling Equipment

5. SPLIT-SYSTEMS

Many central cooling air conditioners and heat pumps are Listed as “split-systems.” Such Listings are given to equipment for which **two or more sections of the system have been evaluated together**.

Sections of systems are typically identified on the Listing Mark as “Section of Central Cooling Air Conditioner” or “Section of Heat Pump,” but may be identified as another type of Listed product such as a “Fan Coil Unit” or an “Electrical Central Heating Furnace.” **These Listed combinations are identified in the UL Electrical Appliance and Utilization Equipment Directory.**

AIR CONDITIONERS, ROOM (ACOT)

This category covers room air conditioners and recreational vehicle (RV) air conditioners. They are encased assemblies designed as a unit and intended as the prime source of cooling and dehumidification, intended to serve a single room, zone or space. **These products may be self-contained or split-system.** They may also be split-system, where the **evaporator section is installed inside**, and the condensing unit is installed outside. The two sections are connected by refrigerant piping and electrical wiring. A console or in-wall-type room air conditioner may have provision to additionally serve a single adjacent room.

Split-system room air conditioners are designed for field interconnection with a matching section. Such units and sections are marked to relate the two for proper installation. The sections may be shipped separately. **Split-system air conditioners may be investigated to ANSI/UL 1995, “Heating and Cooling Equipment.”**

430.113 Energy From More Than One Source ;

Motor operated equipment requires an additional energy source to be disconnected this disconnect location is immediately adjacent to the equipment and unless it meets the requirements of Exception No. 2: A separate disconnecting means shall not be required for a Class 2 remote-control circuit conforming with Article 725, rated not more than 30 volts, and isolated and ungrounded. Such as a thermostat circuit.